NORTHERN DESIGN WORKS

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ADDENDUM

Number:	4	Project Number:	1208
Project:	IMVA Surgery Renovation	Date:	April 30, 2013

The contractor shall acknowledge receipt of all addenda by listing the number where indicated on the bid form.

Drawings, specifications, and / or proposals are herein amended, expanded, and / or modified, and become a part of the Contract Documents with the same effect as if incorporated in the original documents. Any contrary provisions contained, or referred to, in Drawings and / or Specifications, shall remain applicable unless overridden by this Addendum. Revised provisions herein shall include all labor, materials, methods, modifications, etc. required for the completion of the Work.

Specification Modifications:

None.

Drawing Modifications:

1. Sheet M603 Mechanical Equipment Schedules- (reissued)
   a. Revise Rotary Air to Air Heat Recovery Wheel Schedule.
   b. Revise Air Handling Unit Schedule.
   c. Add Fixed Core Heat Exchanger Schedule.
2. Sheet M701 Mechanical Controls Diagrams (reissued)
   a. Add detail 6 – Air Handling Unit Layout (AHU-1).
   b. Revise detail 1 – Air Handling Unit for Surgical Center (AHU-1).
   c. Revise detail 3 - POINTS LIST FOR VAV AIR HANDLING UNIT WITH MINIMUM OUTSIDE AIR AND ENERGY WHEEL.
      - Rename to "POINTS LIST FOR VAV AIR HANDLING UNIT (AHU-1 & ASSOCIATED DEVICES)."
      - Reorganize so point ID's are in order.
      - Add two AO points for the added relief air dampers.
      - Add three BI points for (2) static pressure high limits and (1) static pressure low limit.
3. Sheet M702 Mechanical Controls Diagrams (reissued)
   a. Add detail 4 – Air Handling Unit Layout (AHU-5).
   b. Revise detail 1 – Air Handling Unit for Surgical Center (AHU-5).
   c. Revise detail 2 - POINTS LIST FOR VAV AIR HANDLING UNIT WITH MINIMUM OUTSIDE AIR.
      - Rename to "POINTS LIST FOR VAV AIR HANDLING UNIT (AHU-5, RF-5 & ASSOCIATED DEVICES)."
      - Add (2) AI points.
      - Add (1) BI point.

- Add (1) AO point.

4. Sheet E002 Electrical Notes, Symbols, Schedules and Abbreviations (not reissued)
   a. GENERAL ELECTRICAL NOTES – Add the following statement at the end of those notes:
      - Contractor shall provide training for revised Nurse Call System and revised Fire Alarm System. Nurse Call System training shall consist of two 4 hour sessions. Trained personnel shall include Surgery Department Staff, Engineering Staff, and any other staff the VA deems appropriate. Fire Alarm System training shall consist of two 8 hour sessions and one follow up 4 hour session. Trained personnel shall include VA Security Staff, Engineering Staff, and any other staff the VA deems appropriate
   b. These training requirements supersede other training requirements mentioned in the specifications regarding the Nurse Call System and the Fire Alarm System.

Clarifications:

None

Attachments:

M603, M701, M702

End of Addendum

DUCT PRESSURE CLASS, MATERIAL, & LEAKAGE

SYSTEM	SERVICE	DUCT CONSTRUCTION			LEAKAGE TESTING			REMARKS
		PRESSURE CLASS (IN W.G.)	MATERIALS OF CONSTRUCTION	SMACNA SEAL CLASS	PERCENT OF DUCT TO BE TESTED	TEST PRESSURE (IN W.G.)	ALLOWABLE LEAKAGE (% OF TAKE-OFF)	
AHU-1 & 5	SUPPLY AIR FROM AIR HANDLING UNIT TO SUPPLY AIR TERMINAL	4	GALVANIZED	A	100	4	2	–
	SUPPLY AIR FROM SUPPLY AIR TERMINALS TO AIR OUTLETS	2	GALVANIZED	A	100	2	2	–
	RETURN AIR FROM AIR INLET TO AIR HANDLING UNIT	–2	GALVANIZED	A	100	2	2	–
	OUTDOOR AIR FROM LOUVER TO AIR HANDLING UNIT	–2	GALVANIZED	A	100	2	2	–
EXHAUST FANS	GENERAL EXHAUST AIR ALL INCLUSIVE	–2	GALVANIZED/ ALUM	A	100	2	2	–

DUCT PRESSURE CLASS, MATERIAL, & LEAKAGE

SYSTEM	SERVICE	DUCT CONSTRUCTION			LEAKAGE TESTING			REMARKS
		PRESSURE CLASS (IN W.G.)	MATERIALS OF CONSTRUCTION	SMACNA SEAL CLASS	PERCENT OF DUCT TO BE TESTED	TEST PRESSURE (IN W.G.)	ALLOWABLE LEAKAGE (% OF TAKE-OFF)	
AHU-11	SUPPLY AIR FROM AIR HANDLING UNIT TO SUPPLY AIR TERMINAL	3	GALVANIZED	A	100	3	2	–
	SUPPLY AIR FROM SUPPLY AIR TERMINALS TO AIR OUTLETS	2	GALVANIZED	A	100	2	2	–
	RETURN AIR FROM AIR INLET TO AIR HANDLING UNIT	–2	GALVANIZED	A	100	2	2	–
	OUTDOOR AIR FROM LOUVER TO AIR HANDLING UNIT	–2	GALVANIZED	A	100	2	2	–
EXHAUST FANS	GENERAL EXHAUST AIR ALL INCLUSIVE	–2	GALVANIZED/ ALUM	A	100	2	2	–

FAN SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	AIR FLOW		ESP		FAN							MOTOR ELECTRICAL							CONTROL SEQUENCE	REMARKS
								TYPE	WHEEL	CLASS	ARRANGEMENT, ROTATION, AND DISCHARGE	DIAMETER		MIN % EFF	DRIVE	FAN MAX RPM	NOMINAL POWER			PHASE	VOLT	RPM	SPEED CONTROL		
				CFM	[L/s]	IN	[Pa]					IN	[mm]				BHP	HP	[kW]						
1-SF-1	1400	OR SUITE	1-AHU1	6200	[2900]	3.4	[850]	FLENUM			IN-LINE, HORIZONTAL DISCHARGE		[ ]		DIRECT	2496	12.52	15	[11]	3	208	1750	VARIABLE		1
1-RF-1	1400	OR SUITE	1-AHU1	3340	[1600]	0.75	[190]	FLENUM			IN-LINE, HORIZONTAL DISCHARGE		[ ]		DIRECT	2598	2.62	3	[2]	3	208	1750	VARIABLE		1
1-RF-2	1400	OR SUITE	1-AHU1	1460	[690]	0.75	[190]	FLENUM			IN-LINE, HORIZONTAL DISCHARGE		[ ]		DIRECT	1921	0.68	1	[1]	3	208	1750	VARIABLE		1
1-EF-43	1400	1400	N/A	500	[240]	0.5	[130]	CENTRIFUGAL	BACKWARD INCLINED		ROOF MOUNTED DOWNBLAST				DIRECT	1463	0.1	0.167	[ ]	1	115	1725	VARIABLE		ECM Motor
1-SF-5	2180	SURGERY CENTER	1-AHU5	6250	[3000]	3.2	[800]	FLENUM		2		15	[380]		DIRECT	3114	14.5	15	[11]	3	208	1750	VARIABLE		1
1-RF-5	2180	SURGERY CENTER	1-AHU5	4555	[2100]	1.5	[380]	CENTRIFUGAL	BACKWARD INCLINED		IN-LINE, HORIZONTAL DISCHARGE		[ ]		BELT	1539	2.67	3	[2]	3	208	1725	VARIABLE		
1-RF2180	2180	2180	N/A	520	[250]	0.5	[130]	CENTRIFUGAL	BACKWARD INCLINED		IN-LINE, HORIZONTAL DISCHARGE				DIRECT	1623	0.11	0.167	[ ]	1	115	1725	VARIABLE		ECM Motor
1-EF-40	2101A	SUBSTERILE	EXHAUST	450	[210]	0.5	[130]	CENTRIFUGAL	BACKWARD INCLINED		ROOF MOUNTED DOWNBLAST	10.8	[270]		DIRECT	1538	0.07	0.16	[ ]	1	115	1750	VARIABLE		ECM Motor
1-EF-41	2103	HOUSEKEEPING	EXHAUST	110	[52]	0.5	[130]	CENTRIFUGAL	BACKWARD INCLINED		ROOF MOUNTED DOWNBLAST	11.2	[280]		DIRECT	1157	0.03	0.25	[ ]	1	115	1750	VARIABLE		ECM Motor
1-EF-42	2104	STERILE SUPPLY	EXHAUST	620	[290]	0.5	[130]	CENTRIFUGAL	BACKWARD INCLINED		ROOF MOUNTED DOWNBLAST	11.18	[280]		DIRECT	1573	0.14	0.25	[ ]	1	115	1750	VARIABLE		ECM Motor

NOTE

1. FAN INCLUDED WITH AHU.
2. ALL SELECTIONS ARE BASED ON AN ALTITUDE OF 1000'.

⚠4 FIXED CORE HEAT EXCHANGER SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	MODE	SUPPLY AIR - FIRST PASS												SUPPLY AIR - SECOND PASS												REMARKS
				SUPPLY AIR FLOW		APD		EAT				LAT				AIR FLOW		APD		EAT				LAT				
								Db		Wb		Db		Wb						Db		Wb		Db		Wb		
				CFM	[L/s]	IN	[Pa]	°F	[°C]	°F	[°C]	°F	[°C]	°F	[°C]	CFM	[L/s]	IN	[mm]	°F	[°C]	°F	[°C]	°F	[°C]	°F	[°C]	
HX-1	1400	AHU-1	SUMMER/ WINTER	6200	[2900]	0.84	[75]	68.7	[20]	55.9	[13]	60.2	[18]	53	[12]	6200	[2900]	0.82	[21]	48	[9]	47	[8]	62.5	[17]	53	[12]	1

NOTES:

1. SUPPLY AIRSTREAM CROSSES THROUGH THE HEAT EXCHANGER TWICE.

AIR HANDLING UNIT SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE	AIR FLOW	AIR FLOW						SUPPLY FAN MARK	RETURN OR RELIEF FAN MARK	EXHAUST FAN MARK	PREFILTER MARK	AFTER FILTER MARK	FINAL FILTER MARK	HEAT RECOVERY MARK ⚠4	PREHEAT COIL MARK	COOLING COIL MARK	REHEAT COIL	HUMIDIFIER MARK	REMARKS
					SUPPLY		MIN OA		RETURN													
					CFM	[L/s]	CFM	[L/s]	CFM	[L/s]												
AHU-5	2180	SURGERY CENTER	INDOOR	VAV	6250	[3000]	1500	[710]	4600	[2200]	1-SF5	1-RF5	n/a	1-PF5	1-AF5	1-FF5	EW-5	1-PHC5	1-CC5	AT TU	1-SH5	INCLUDES DESICCANT WHEEL
AHU-1	1400	OR SUITE	INDOOR	VAV	6200	[2900]	1750	[830]	4155	[2000]	1-SF1	1-RF1, 1-RF2	n/a	1-PFOA, 1-PFRA	1-FFOA	1-FF	EW-1, HX-1	1-PHC1	1-CC1	AT TU	1-SH1	INCLUDES ENTHALPY WHEEL AND FIXED PLATE AIR TO AIR HEAT EX. ⚠4

NOTES ⚠3

1. AHU-5 ENTERING AIR CONDITIONS: WINTER: 45 F DB, SUMMER: 80.9 F DB / 66.6 F WB.
2. AHU-1 ENTERING AIR CONDITIONS: WINTER: 38.0 F DB, SUMMER: 81.1 F DB / 66.7 F WB.
3. AHU-5 DISCHARGE AIR PERFORMANCE OFF UNIT AFTER ALL COMPONENTS: 56.7 F DB / 47.7 GR/LB.
4. AHU-1 DISCHARGE AIR PERFORMANCE OFF UNIT AFTER ALL COMPONENTS: 62.5 F DB / 53 F WB. ⚠4

ROTARY AIR TO AIR HEAT RECOVERY WHEEL SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	MODE	SUPPLY AIR										EXHAUST AIR										ROTOR MOTOR				REMARKS
				SUPPLY AIR FLOW		APD		EAT				LAT				AIR FLOW		APD		EAT				LAT						
								Db		Wb		Db		Wb						Db		Wb		Db		Wb				
				CFM	[L/s]	IN	[Pa]	°F	[°C]	°F	[°C]	°F	[°C]	°F	[°C]	CFM	[L/s]	IN	[mm]	°F	[°C]	°F	[°C]	°F	[°C]	°F	[°C]	HP	[kW]	PHASE	VOLT	
EW-1	1400	AHU-1	SUMMER	1750	[830]	0.51	[75]	95	[35]	75	[24]	72	[22]	58	[14]	1750	[830]	0.5	[13]	67	[19]	53.5	[12]	88.9	[32]	72.2	[22]	0.5	[ ]	3	208	2
			WINTER	1750	[830]	0.43	[11]	-20	[-29]	-20	[-29]	48	[9]	39.5	[4]	1750	[830]	0.45	[11]	67	[19]	53.5	[12]	-1	[-18]	-1	[-18]					
EW-5	2180	AHU-5	SUMMER	6250	[3000]	0.7	[18]	80.9	[27]	69	[21]	75.1	[24]	71	[22]	6250	[3000]	0.7	[18]	51.8	[11]	51.5	[11]	56.7	[14]	51.5	[11]		[ ]	3	208	1, 3

⚠4

NOTES:

1. DESICCANT WHEEL.
2. ENTHALPY WHEEL.
3. EW-5: SUPPLY AIRSTREAM CROSSES THROUGH THE WHEEL TWICE, THE "SUPPLY AIR" COLUMNS RELATE TO THE SUPPLY AIR'S FIRST PASS THRU THE WHEEL. "EXHAUST AIR" COLUMNS RELATE TO THE SUPPLY AIR'S SECOND PASS THRU THE WHEEL.

FOUR PIPE FAN COIL UNIT SCHEDULE

MARK	LOCATION	TYPE	FAN AIR FLOW		OUTDOOR AIR FLOW		EXTERNAL APD		COOLING REQUIREMENTS												HEATING REQUIREMENTS										FILTER	FAN MOTOR						
								MIN SENS CAPACITY		MIN TOTAL CAPACITY		EAT				FLOW		EWT		WPD		RUNOUT SIZE		MIN CAPACITY		EAT Db		FLOW		EWT		WPD		RUNOUT SIZE			POWER		PHASE	VOLT	RPM	SPEED CONTROL	REMARKS
												Db		Wb																											
			CFM	[L/s]	CFM	[L/s]	IN WG	[Pa]	BTUH	[W]	BTUH	[W]	°F	[°C]	°F	[°C]	GPM	[L/s]	°F	[°C]	FT	[kPa]	IN	[mm]	BTUH	W	°F	[°C]	GPM	[L/m]	°F	[°C]	FT	[kPa]	IN	[mm]	MERV RATING	HP	[W]					
1-FC-1400	1400	HORIZONTAL	1100	[520]	500	[240]	0.37	[93]	30070	[8800]	36710	[11000]	80	[27]	66	[19]	9.8	[130]	45	[7]	8	[24]	0	[ ]	76570	[22000]	28	[-2]	7.9	[30]	140	[60]	8.7	[26]	0.000	[ ]	7	0.33	[250]	1	208		CONSTANT	1,2
1-FC-2180	1600	HORIZONTAL	1280	[600]	525	[250]	0.27	[68]	42290	[12000]	62340	[18000]	83	[28]	70	[21]	16.5	[220]	45	[7]	15.9	[48]	0	[ ]	98590	[29000]	36	[2]	10.2	[39]	140	[60]	16.3	[49]	0.000	[ ]	7	0.33	[250]	1	208		CONSTANT	1,2
⚠3 1-FC-1218A	1218A	WALL MOUNT	270	[130]	0	[ ]	0	[ ]	5500	[1600]	6500	[1900]	75	[24]	64	[18]	1.8	[24]	45	[7]	3.6	[11]	0	[ ]	0	[ ]	0	[-18]	0	[ ]	0	[-18]	0	[ ]	0.000	[ ]	7	0.017	[13]	1	208		CONSTANT	2

NOTES

1. Unit has 2 - 1/3 HP fans. FLA is 6A.
2. CHILLED WATER IS 40% PROPYLENE GLYCOL.

STEAM HUMIDIFER SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SEVICE	HUMIDIFIER TYPE	AIR FLOW		# OF MANIFOLDS	EAT						LAT		SOURCE	STEAM						CONTROL TYPE	TRAP			REMARKS
							Db		Wb		DEWPOINT		DEWPOINT			PRESS ENT VALVE		PRESS ENT HEATER		FLOW			MARK	CAPACITY		
				CFM	[L/s]		°F	[°C]	°F	[°C]	°F	[°C]	°F	[°C]		PSIG	[kPa]	PSIG	[kPa]	LBS/HR	[kg/HR]			LBS/HR	[kg/HR]	
1-SH-1	1400	1-AHU-1	DUCT-MOUNTED DISPERSION TUBE	6200	[2900]	2	55	[13]	44	[7]	10	[-12]	45	[7]	CLEAN STEAM	15	[100]	10	[69]	175.5	[80]		1-ST-1400-1 1-ST-1400-2 1-ST-1400-3	400 1000 1000	[180] [450] [450]	
1-SH-5	2180	1-AHU-5	DUCT-MOUNTED DISPERSION TUBE	6250	[3000]	2	55	[13]	44	[7]	10	[-12]	45	[7]	CLEAN STEAM	15	[100]	10	[69]	51.6	[23]		1-ST-2180-1 1-ST-2180-2 1-ST-2180-3	400 1000 1000	[180] [450] [450]	
1-SH-2104	1-AFCV-S-2104	1-AHU-1	DUCT-MOUNTED DISPERSION TUBE	355	[170]	1	55	[13]	50	[10]	45	[7]	53	[12]	CLEAN STEAM	15	[100]	10	[69]	9.9	[5]		1-ST-2104	300	[140]	
1-SH-2134	1-TU-11-2134	1-AHU-11	DUCT-MOUNTED DISPERSION TUBE	50	[24]	1	55	[13]	50	[10]	45	[7]	53	[12]	CLEAN STEAM	15	[100]	10	[69]	1.4	[1]		1-ST-2134	300	[140]	
1-SH-2171	1-TU-11-2171	1-AHU-11	DUCT-MOUNTED DISPERSION TUBE	80	[38]	1	55	[13]	50	[10]	45	[7]	53	[12]	CLEAN STEAM	15	[100]	10	[69]	2.2	[1]		1-ST-2171	300	[140]	

Revisions:	Date
ADDENDUM #4 ⚠4	04/29/2013
ADDENDUM #3 ⚠3	04/25/2013
100% CONSTRUCTION DOCUMENTS	03/06/2013

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NDW PROJECT NUMBER:1208

Drawing Title: MECHANICAL EQUIPMENT SCHEDULES
Approved Project Director:
Project Title: Renovate Surgery
Location: IRON MOUNTAIN, MICHIGAN
Date: 03/06/2013
Checked: BLD
Drawn: JRW
Project Number: 585-10-104
Building Number: 1
Drawing Number: M603
Dwg. 180 of 243

Office of Construction and Facilities Management
Department of Veterans Affairs

VA FORM 08-6231, OCT 1978

CONTROLS SYMBOLS

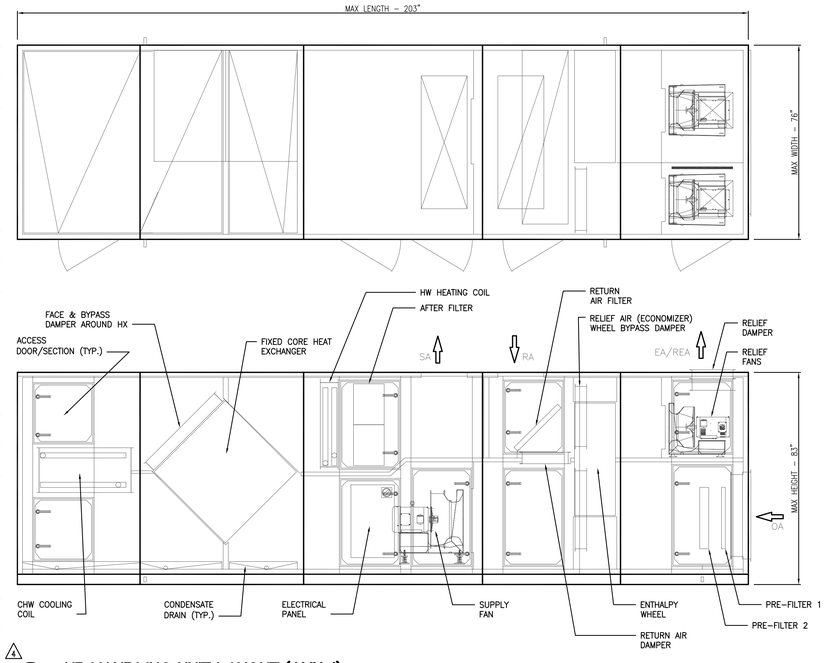
T	ROOM THERMOSTAT/TRANSMITTER – WALL MOUNT
M	ROOM HUMIDISTAT (MOISTURE)/TRANSMITTER – WALL MOUNT
TT	TEMPERATURE TRANSMITTER
TT	TEMPERATURE TRANSMITTER, AVERAGING ELEMENT
MT	MOISTURE (HUMIDITY) TRANSMITTER
PT	PRESSURE TRANSMITTER
SPS	STATIC PRESSURE SENSOR
FT	FLOW TRANSMITTER
IT	CURRENT TRANSMITTER
CT	CONDUCTIVITY TRANSMITTER
SD	SMOKE DETECTOR
PDT	PRESSURE DIFFERENTIAL TRANSMITTER
PDS	PRESSURE DIFFERENTIAL SWITCH
HS	HAND SWITCH (HAND–OFF–AUTO SWITCH)
ZC	VALVE OR DAMPER POSITION CONTROLLER
KR	LOCAL RECORDING TIME CLOCK (RUNTIME)
TSL	TEMPERATURE SWITCH, LOW (FREEZESTAT)
TSH	TEMPERATURE SWITCH, HIGH (FREEZESTAT)
LC	LEVEL CONTROLLER
LT	LEVEL TRANSMITTER

CONTROLS SYMBOLS

PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
EPT	ELECTRONIC TO PNEUMATIC TRANSDUCER
AT CO2	CARBON DIOXIDE TRANSMITTER
AT CO	CARBON MONOXIDE TRANSMITTER
AT OC	OCCUPANCY SENSOR
LTCP	LOCAL TEMPERATURE CONTROL PANEL
HVAC	HVAC CONTROL PANEL
VSMC	VARIABLE SPEED MOTOR CONTROLLER
FACP	FIRE ALARM CONTROL PANEL
ECC	INTEGRATE CONTROL POINT ON REMOTE GRAPHICS WORKSTATION AT ENERGY CONTROL CENTER
TC	TEMPERATURE CONTROLLER. SEE SEQUENCE OF OPERATION
PC	PRESSURE CONTROLLER. SEE SEQUENCE OF OPERATION
SC	SPEED CONTROLLER. SEE SEQUENCE OF OPERATION
FC	FLOW CONTROLLER. SEE SEQUENCE OF OPERATION
FSH	FLOW SWITCH HIGH
FSL	FLOW SWITCH LOW
KC	TIME CLOCK CONTROLLING EQUIPMENT ON A SCHEDULE

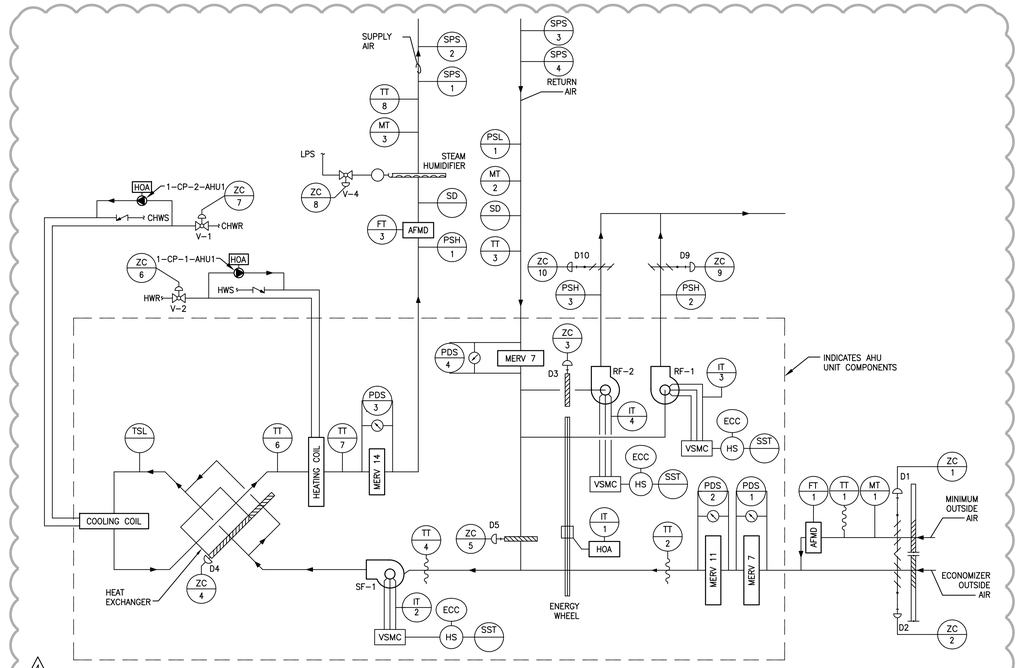
CONTROLS SYMBOLS

	TEMPERATURE SENSING ELEMENT FOR TRANSMITTING TEMPERATURE TO EMCS (PROVIDE 12 INCHES [200mm] MINIMUM LENGTH IN DUCT WHEN SPACE PERMITS.)
A	SENSOR WITH AVERAGING ELEMENT TO TRANSMIT TEMPERATURE TO EMCS
	MOTOR STARTER
M	ELECTRIC OPERATED CONTROL DAMPER/OR VALVE



6 AIR HANDLING UNIT LAYOUT (AHU-1)

NTS



1 AIR HANDLING UNIT CONTROL DIAGRAM (AHU-1)

NTS

JOB: 0555.09
BUILDING: VA SAMPLE POINTS LIST

SYSTEM: VAV AIR HANDLER

SYSTEM COMPONENT:	POINT ID	ABBREVIATION	PRIORITY/ADDITIONAL NO.	REMARKS
RETURN AIR TEMPERATURE	AI–1	RAT		TT–3
RETURN AIR HUMIDITY	AI–2	RAH		MT–2
RETURN AIR FLOW (CFM)	AI–3	RAF		FT–2
MIXED AIR TEMPERATURE	AI–4	MAT		TT–4
HEAT TEMPERATURE	AI–5	PHT		TT–7
COOLING COIL TEMPERATURE	AI–6	CCT		TT–5
DISCHARGE AIR TEMPERATURE	AI–7	DAT		TT–8
DISCHARGE STATIC PRESSURE	AI–8	DASP		SPS–1
DISCHARGE STATIC PRESSURE	AI–9	DASP		SPS–2
RETURN STATIC PRESSURE	AI–10	RASP		SPS–3
RETURN STATIC PRESSURE	AI–11	RASP		SPS–4
DISCHARGE AIR HUMIDITY	AI–12	DAH		MT–3
SUPPLY AIR FLOW (CFM)	AI–13	SAF		FT–3
OUTSIDE AIR TEMPERATURE	AI–14	OAT		
HEAT EXCHANGER TEMP.	AI–15	HXT		TT–6
RETURN LOW PRESSURE	BI–1	RLP		PSL–1
RELIEF FAN 1 STATUS	BI–2	RF–STS		IT–3
SUPPLY FAN STATUS	BI–3	SF–STS		IT–2
MIXED AIR LOW LIMIT	BI–4	TSL–1		TT–4
STATIC PRESSURE HIGH LIMIT	BI–5	SPHL		PSH–1
SUPPLY FAN VSMC ALARM	BI–6	SF–ALA		
RELIEF FAN 1 VSMC ALARM	BI–7	RF–ALA		
RELIEF FAN 2 VSMC ALARM	BI–8	RF–ALA		
ENERGY WHEEL STATUS	BI–9	EW–STS		IT–1
RELIEF FAN 2 STATUS	BI–10	RF–STS		IT–4
PREFILTER 1 DIFF. PRESSURE	BI–11	DP1		PDS–1
PREFILTER 2 DIFF. PRESSURE	BI–12	DP2		PDS–2
FINAL FILTER DIFF. PRESSURE	BI–13	DP3		PDS–3
RETURN AIR FILTER DIFF. PRESSURE	BI–14	DP4		PDS–4
STATIC PRESSURE HIGH LIMIT	BI–15	SPHL		PSH–2
STATIC PRESSURE HIGH LIMIT	BI–16	SPHL		PSH–3
STATIC PRESSURE LOW LIMIT	BI–17	SPLL		PSL–1
RELIEF FAN 1 VSMC	AO–1	RF–SPD		FULL COMMUNICATION
RELIEF FAN 2 VSMC	AO–2	RF–SPD		FULL COMMUNICATION
SUPPLY FAN VSMC	AO–3	SF–SPD		FULL COMMUNICATION
OUTSIDE AIR DAMPER	AO–4	OAD		ZC–2
RETURN AIR DAMPER	AO–5	RAD		ZC–5
EXHAUST AIR DAMPER	AO–6	EAD		ZC–3
MINIMUM OUTSIDE AIR DAMPER	AO–7	MIN–OAD		ZC–1
HEAT VALVE V–2	AO–8	PHT–V1		ZC–6
COOLING VALVE V–1	AO–9	CLG–V1		ZC–7
STEAM HUMIDIFIER VALVE V–4	AO–10	HUM–V4		ZC–8
HEAT EXCHANGER DAMPER	AO–11	HXFBD		ZC–4
MIN RELIEF AIR DAMPER	AO–12	RADMINOA		ZC–9
ECONOMIZER RELIEF AIR DAMPER	AO–13	RADECONOA		ZC–10
EXHAUST FAN START/STOP	BO–1	RF–SST		
SUPPLY FAN START/STOP	BO–2	SF–SST		
HW CIRCULATING PUMP STATUS	BO–3	P1–STS		P–1
CW CIRCULATING PUMP STATUS	BO–4	P2–STS		P–2

3 POINTS LIST FOR VAV AIR HANDLING UNIT (AHU-1 + ASSOCIATED DEVICES)

NTS

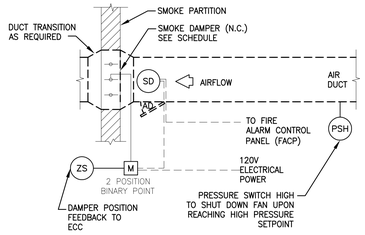
SYSTEM: STEAM HUMIDIFIER

SYSTEM COMPONENT:	POINT ID	ABBREVIATION	REMARKS
HUMIDITY HIGH LIMIT	BI–1	HHL	MT
RETURN AIR HUMIDITY	AI–1	RAH	MT
STEAM CONTROL VALVE	AO–1	V–S2	ZC
STEAM SHUT–OFF VALVE	BI–3	V–S1	
HUMIDIFIER JACKET TEMP.	A1–1	HJT	TSH
AIR FLOW	BI–2	AFS	

STEAM HUMIDIFIER
ALL SECONDARY HUMIDIFICATION ROOM CONTROL POINTS TO BE CONNECTED TO THE EXISTING BUILDING AUTOMATION SYSTEM (BAS).

2 POINTS LIST FOR STEAM HUMIDIFIER (AHU AND/OR ROOM)

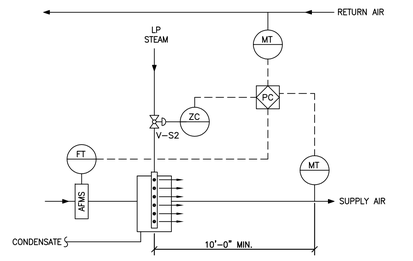
NTS



NOTE:
UPON DETECTION OF SMOKE BY THE SMOKE DETECTOR, THE SMOKE DAMPER SHALL CLOSE & SEND AN ALARM TO THE ECC.

5 SMOKE DAMPER CONTROL DIAGRAM

NTS



STEAM HUMIDIFIER
RETURN AIR HUMIDITY SHALL BE MONITORED. ON A CALL FOR HUMIDIFICATION, HUMIDIFIER VALVE V–S2 SHALL MODULATE TO MAINTAIN THE RETURN AIR HUMIDITY SET POINT TO 30% (ADJUSTABLE). THE HIGH LIMIT HUMIDITY SENSOR, LOCATED IN THE SUPPLY AIR DUCT 10 FEET AWAY FROM THE HUMIDIFIER SHALL DISABLE THE HUMIDIFIER AND GIVE AN ALARM SIGNAL TO THE ECC, IF THE SUPPLY AIR HUMIDITY EXCEEDS 90% RH (ADJUSTABLE). THE OUTDOOR AIRFLOW TRANSMITTER SHALL PROVE AIRFLOW BEFORE HUMIDITY CONTROLS ARE ACTIVATED. CONDENSATE TEMP. SENSOR (TSH) SHALL OVERRIDE HUMIDIFIER CONTROL VALVE (V–S2) WHENEVER CONDENSATE IS 205°F OR HIGHER. CRITICAL ROOMS (OR, CYSTOSCOPY) WILL BE EQUIPPED WITH ROOM HUMIDITY SENSORS TO TREND RH% AND ALARM IN THE EVENT OF OUT OF SPEC. CONDITIONS.

4 STEAM HUMIDIFIER CONTROLS FOR AHU

NTS

ADDENDUM #4	4 04/29/2013
100% CONSTRUCTION DOCUMENTS	03/06/2013
Revisions:	Date

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NDW PROJECT NUMBER:1208

Drawing Title: MECHANICAL CONTROL DIAGRAMS
Approved: Project Director
Project Title: Renovate Surgery
Location: IRON MOUNTAIN, MICHIGAN
Date: 03/06/2013 | Checked: BLD | Drawn: JRW
Project Number: 585-10-104
Building Number: 1
Drawing Number: M701
Dwg. 185 of 243

Office of Construction and Facilities Management
Department of Veterans Affairs

VA FORM 08–6231, OCT 1978

CONTROLS SYMBOLS

T	ROOM THERMOSTAT/TRANSMITTER – WALL MOUNT
M	ROOM HUMIDISTAT (MOISTURE)/TRANSMITTER – WALL MOUNT
TT	TEMPERATURE TRANSMITTER
TT	TEMPERATURE TRANSMITTER, AVERAGING ELEMENT
MT	MOISTURE (HUMIDITY) TRANSMITTER
PT	PRESSURE TRANSMITTER
SPS	STATIC PRESSURE SENSOR
FT	FLOW TRANSMITTER
IT	CURRENT TRANSMITTER
CT	CONDUCTIVITY TRANSMITTER
SD	SMOKE DETECTOR
PDT	PRESSURE DIFFERENTIAL TRANSMITTER
PDS	PRESSURE DIFFERENTIAL SWITCH
HS	HAND SWITCH (HAND–OFF–AUTO SWITCH)
ZC	VALVE OR DAMPER POSITION CONTROLLER
KR	LOCAL RECORDING TIME CLOCK (RUNTIME)
TSL	TEMPERATURE SWITCH, LOW (FREEZESTAT)
TSH	TEMPERATURE SWITCH, HIGH (FREEZESTAT)
LC	LEVEL CONTROLLER
LT	LEVEL TRANSMITTER

CONTROLS SYMBOLS

PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
EPT	ELECTRONIC TO PNEUMATIC TRANSDUCER
AT CO_2	CARBON DIOXIDE TRANSMITTER
AT CO	CARBON MONOXIDE TRANSMITTER
AT OC	OCCUPANCY SENSOR
LTCP	LOCAL TEMPERATURE CONTROL PANEL
HVAC	HVAC CONTROL PANEL
VSMC	VARIABLE SPEED MOTOR CONTROLLER
FACP	FIRE ALARM CONTROL PANEL
ECC	INTEGRATE CONTROL POINT ON REMOTE GRAPHICS WORKSTATION AT ENERGY CONTROL CENTER
TC	TEMPERATURE CONTROLLER. SEE SEQUENCE OF OPERATION
PC	PRESSURE CONTROLLER. SEE SEQUENCE OF OPERATION
SC	SPEED CONTROLLER. SEE SEQUENCE OF OPERATION
FC	FLOW CONTROLLER. SEE SEQUENCE OF OPERATION
FSH	FLOW SWITCH HIGH
FSL	FLOW SWITCH LOW
KC	TIME CLOCK CONTROLLING EQUIPMENT ON A SCHEDULE

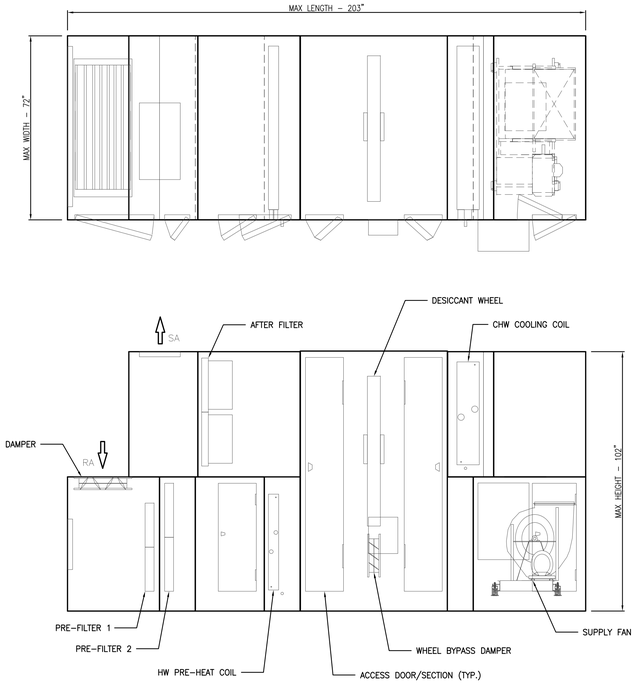
CONTROLS SYMBOLS

TEMPERATURE SENSING ELEMENT FOR TRANSMITTING TEMPERATURE TO EMCS (PROVIDE 12 INCHES [200mm] MINIMUM LENGTH IN DUCT WHEN SPACE PERMITS.)

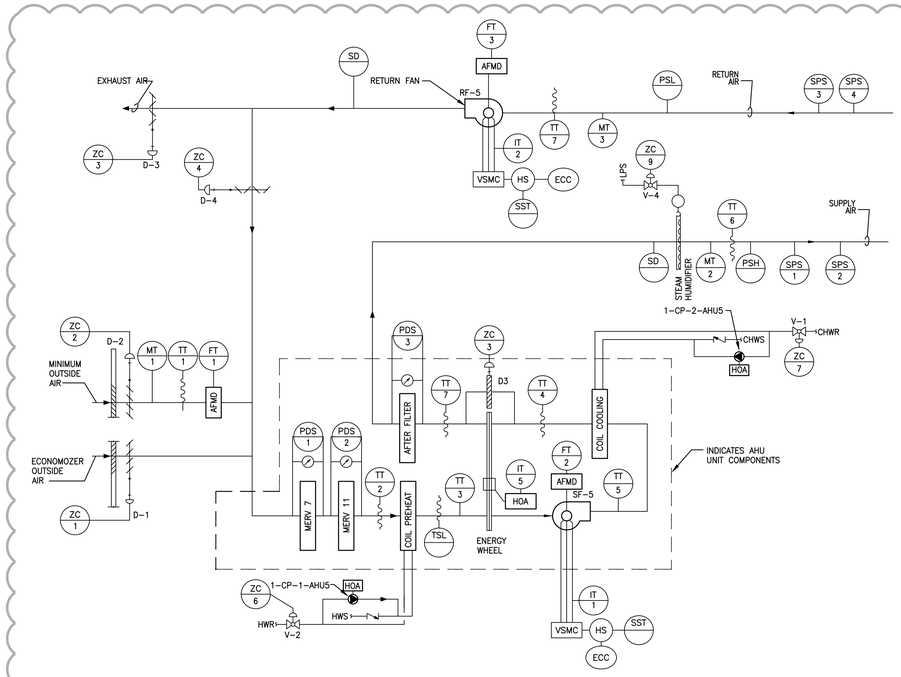
A — SENSOR WITH AVERAGING ELEMENT TO TRANSMIT TEMPERATURE TO EMCS

MOTOR STARTER

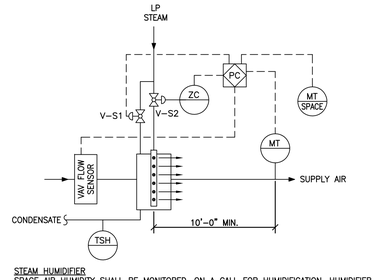
M — ELECTRIC OPERATED CONTROL DAMPER/OR VALVE



4 **AIR HANDLING UNIT LAYOUT (AHU-5)**
NTS



1 **AIR HANDLING UNIT CONTROL DIAGRAM (AHU-5)**
NTS



STEAM HUMIDIFIER
SPACE AIR HUMIDITY SHALL BE MONITORED. ON A CALL FOR HUMIDIFICATION, HUMIDIFIER VALVE V–S2 SHALL MODULATE TO MAINTAIN THE SPACE AIR HUMIDITY SET POINT TO 30% (ADJUSTABLE). PRIOR TO ACTIVATION OF V–S2, THE ON/OFF CONTROL VALVE V–S1 SHALL BE ENABLED THROUGH ECC AND JACKET TEMPERATURE SENSED BY TSH SHALL BE WARM ENOUGH TO PREVENT CONDENSATION. THE HIGH LIMIT HUMIDITY SENSOR, LOCATED IN THE SUPPLY AIR DUCT 10 FEET AWAY FROM THE HUMIDIFIER SHALL DISABLE THE HUMIDIFIER AND GIVE AN ALARM SIGNAL TO THE ECC, IF THE SUPPLY AIR HUMIDITY EXCEEDS 90% RH (ADJUSTABLE). THE AIRFLOW TRANSMITTER SHALL PROVE AIRFLOW BEFORE HUMIDITY CONTROLS ARE ACTIVATED. CONDENSATE TEMP. SENSOR (TSH) SHALL OVERRIDE HUMIDIFIER CONTROL VALVE (V–S2) WHENEVER CONDENSATE IS 205°F OR HIGHER.

3 **STEAM HUMIDIFIER CONTROLS (INDIVIDUAL ROOM)**
NTS

JOB: 0555.09
BUILDING: VA SAMPLE POINTS LIST

PAGE:

SYSTEM: VAV AIR HANDLER

SYSTEM COMPONENT:	POINT ID	ABBREVIATION	POINT LEGEND: PRIORITY AND ALTERNATE NO. / ELECTRIC SPACE SYSTEM NO. / DEVICE CLOSE	SYSTEM OUTPUTS BINARY: DEVICE COMMAND / VALVE POSITION / STATUS	SYSTEM OUTPUTS ANALOG: PRESSURE SETPOINT / HIGH TEMP. LIMIT	SYSTEM INPUTS BINARY: TEMPERATURE (HI) / PRESSURE (HI) / FLOW / FREEZE / SMOKE / VALVE POSITION / MOISTURE	SYSTEM INPUTS ANALOG: PRESSURE / TEMPERATURE / HUMIDITY / FLOW / VALVE POSITION	SYSTEM SOFTWARE/CONTROL ALARM PROCESSING: AREA ALARM PANEL / AREA ALARM TAKES CONTROL / LOW LIMIT	SYSTEM SOFTWARE/CONTROL APPLICATION/FUNCTION: CONTROL START/STOP / CONTROL SETPOINT / CHILLED WATER TEMPERATURE RESET / TEMPERATURE RESET / HUMIDITY SETPOINT / DEMAND LIMIT CONTROL / TIME CLOCK / PRESSURE INDEPENDENT CONTROL / PRESSURE DEPENDENT CONTROL / FLOW CONTROL / DDC COMMUNICATION	REMARKS
RETURN AIR TEMPERATURE	AI–1	RAT			●		●			TT–7
RETURN AIR HUMIDITY	AI–2	RAH			●			●		MT–3
RETURN AIR FLOW (CFM)	AI–3	RAF			●		●		●	FT–3
MIXED AIR TEMPERATURE	AI–4	MAT			●	●				TT–2
PRE–HEAT TEMPERATURE	AI–5	PHT			●	●				TT–3
COOLING COIL TEMPERATURE	AI–6	CCT			●	●			●	TT–4
DISCHARGE AIR TEMPERATURE	AI–7	DAT			●	●			●	TT–6
DISCHARGE STATIC PRESSURE	AI–8	DASP			●		●		●	SPS–1
DISCHARGE STATIC PRESSURE	AI–9	DASP			●		●		●	SPS–2
RETURN STATIC PRESSURE	AI–10	RASP			●		●		●	SPS–3
RETURN STATIC PRESSURE	AI–11	RASP			●		●		●	SPS–4
DISCHARGE AIR HUMIDITY	AI–12	DAH			●			●		MT–2
SUPPLY AIR FLOW (CFM)	AI–13	SAF			●		●		●	FT–2
OUTSIDE AIR TEMPERATURE	AI–14	OAT				●				TT–1
POST WHEEL TEMPERATURE	AI–15	PWT			●	●				TT–5
⚠4 WHEEL DISCHARGE TEMP	AI–16	WDT			●	●				TT–7
RETURN LOW PRESSURE	BI–1	RLP				●				RSC
RETURN FAN STATUS	BI–2	EF–STS			●					IT–2
SUPPLY FAN STATUS	BI–3	SF–STS			●					IT–1
MIXED AIR LOW LIMIT	BI–4	TSL–1				●				
STATIC PRESSURE HIGH LIMIT	BI–5	SPHL						●		PSH
HUMIDITY HIGH LIMIT	BI–6	HHL						●		MT–2
SUPPLY FAN VSMC ALARM	BI–7	SF–ALA			●					
RETURN FAN VSMC ALARM	BI–8	RF–ALA			●					
⚠4 DESICCANT WHEEL STATUS	BI–9	EW–STS			●					IT–5
STATIC PRESSURE LOW LIMIT	BI–10	SPLL								PSL
RETURN FAN VSMC	AO–1	RF–SPD		●						FULL COMMUNICATION
SUPPLY FAN VSMC	AO–2	SF–SPD		●						FULL COMMUNICATION
OUTSIDE AIR DAMPER	AO–3	OAD		●						ZC–1
RETURN AIR DAMPER	AO–4	RAD		●						ZC–4
EXHAUST AIR DAMPER	AO–5	EAD		●						ZC–3
MINIMUM OUTSIDE AIR DAMPER	AO–7	MIN–OAD		●						ZC–2
PRE–HEAT VALVE V–2	AO–8	PHT–V1		●						ZC–5
COOLING VALVE V–1	AO–9	CLG–V1		●						ZC–6
STEAM HUMIDIFIER VALVE V–4	AO–10	HUM–V4		●						ZC–7
⚠4 WHEEL BYPASS DAMPER	AO–11	WBD		●						ZC–8
RETURN FAN START/STOP	BO–1	RF–SST	●						●	
SUPPLY FAN START/STOP	BO–2	SF–SST	●						●	
HW CIRCULATING PUMP STATUS	BO–4	P1–STS	●							P–1
CW CIRCULATING PUMP STATUS	BO–5	P2–STS	●							P–2

⚠2 **POINTS LIST FOR VAV AIR HANDLING UNIT (AHU-5, RF-5 + ASSOCIATED DEVICES)**
NTS

Revisions:	Date
ADDENDUM #4 ⚠1	04/29/2013
100% CONSTRUCTION DOCUMENTS	03/06/2013

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Drawing Number: M702
Dwg. 186 of 243

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Department of Veterans Affairs

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